

3 NOVEMBER 2000

Weather



**AEROSPACE WEATHER OPERATIONS -  
ROLES AND RESPONSIBILITIES**

**COMPLIANCE WITH THIS PUBLICATION IS MANDATORY**

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This instruction implements Air Force Policy Doctrine (AFPD) 15-1, Atmospheric and Space Environmental Support. It defines the mission, organization, roles, and responsibilities of Air Force Weather's services and support. It details what Air Force Weather (AFW) does. Other 15-series Air Force instructions and manuals provide instructions on how AFW support is provided. This instruction applies to all organizations providing or receiving AFW support with the exception of AFW units who have not reengineered. Organizations may supplement this instruction with the coordination of HQ USAF/XOW. Attachment 1 is a glossary of references, abbreviations and acronyms. Supplements must be sent to HQ USAF/XOWP, 1490 Air Force Pentagon, Washington DC 20330-1490.

Maintain and dispose of all records created as a result of prescribed processes in this instruction in accordance with AFMAN 37-139, *Records Disposition Schedule*.

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## Chapter 1

### MISSION AND ORGANIZATION

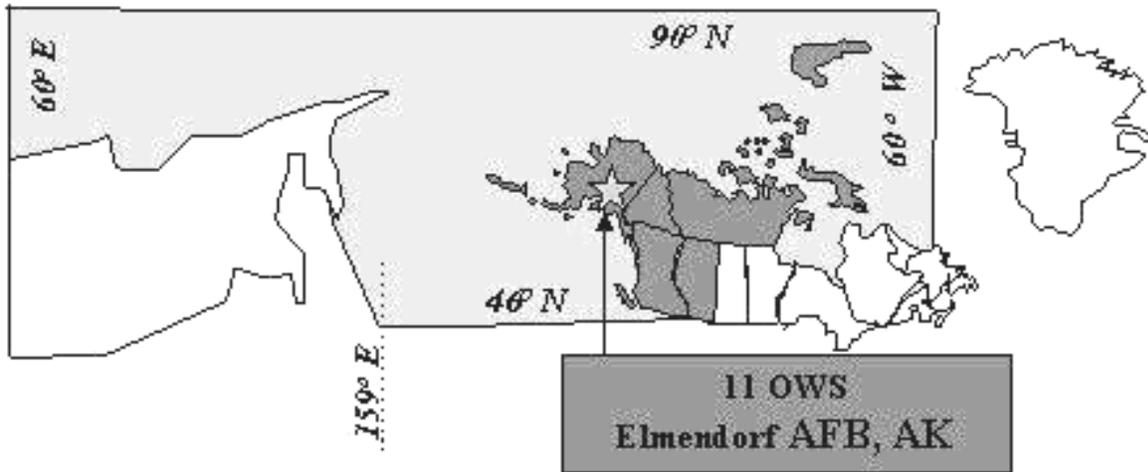
**1.1. Mission.** Air Force Weather (AFW) provides high-quality, mission-tailored weather and space environment observations, forecasts, and services to the United States Air Force (USAF), United States Army (USA), and a variety of United States (U.S.) Government departments and agencies.

**1.2. Organization.** AFW services and support are organized under the functional management of the Directorate of Weather, Deputy Chief of Staff for Air and Space Operations, Headquarters United States Air Force (HQ USAF/XOW). AFW operates through a three-tier organizational structure corresponding to the three levels of military operations - strategic, operational and tactical.

1.2.1. Strategic Level. AFW's strategic weather units are centers of expertise in providing strategic-level terrestrial and space weather products and support necessary to conduct military operations. The Air Force Weather Agency (AFWA), an Air Force Field Operating Agency (FOA) under HQ USAF/XOW, is the principal strategic weather center in AFW. In addition to strategic-level weather support, AFWA also provides select operational and tactical-level support to special operations, and performs resource management functions for standard weather systems and centrally managed AFW contracts and programs.

1.2.2. Operational Level. AFW's Operational Weather Squadrons (OWSs) are theater or regional centers of expertise. Nine OWSs provide operational-level weather products and support to theater Commander In Chief (CINC) geographic Areas of Responsibility (AOR). Figures 1.1 - 1.10 define the OWS and AFWA AORs. In addition Staff Weather Officers (SWOs) assigned to USAF Major Commands (MAJCOMS), USA Major Commands (MACOMs), and Unified Commands provide direct support to these Headquarters and oversee AFW support aligned with the Command's subordinate operating forces.

Figure 1.1. 11th OWS AOR.



**Under Command and Control of 611 AOG, in support of the 11<sup>th</sup> Air Force AOR.**

**11 OWS AOR:** Alaska, including the Aleutians, Arctic Ocean; Canadian provinces of Yukon, Northwest Territories, Nunavut, British Columbia and Alberta.

Figure 1.2. 15th OWS AOR.



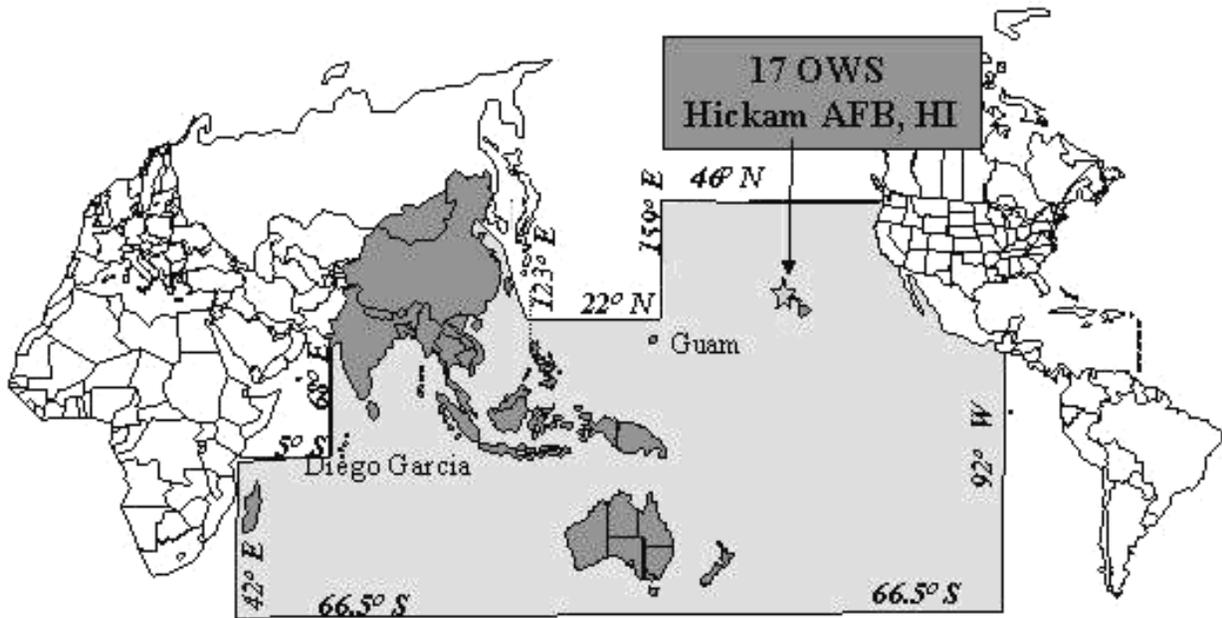
#### **Under Command and Control of AMC TACC**

**15 OWS AOR:** ND, SD, NE, MN, IA, WI, IL, IN, MI, OH, WV, NY, PA, MD, DE, NJ, CT, RI, MA, NH, VT, ME, DC (including Fairfax & Arlington Counties in northern VA); Great Lakes; Central and Eastern Canada – to include Saskatchewan, Manitoba, Ontario, Quebec, New Brunswick, Newfoundland, Nova Scotia, Labrador, Prince Edward Islands; Greenland; part of North Atlantic and region south of Antarctic circle ( $66.5^{\circ}$  S).

#### **\* Exceptions:**

- 1) 25 OWS provides support to 90 Space Wing (F.E. Warren AFB) assets within the 15 OWS AOR.
- 2) 15 OWS AOR extends out to the US Air Defense Identification Zone (ADIZ), approximately 200 miles off the U.S. Atlantic coast.

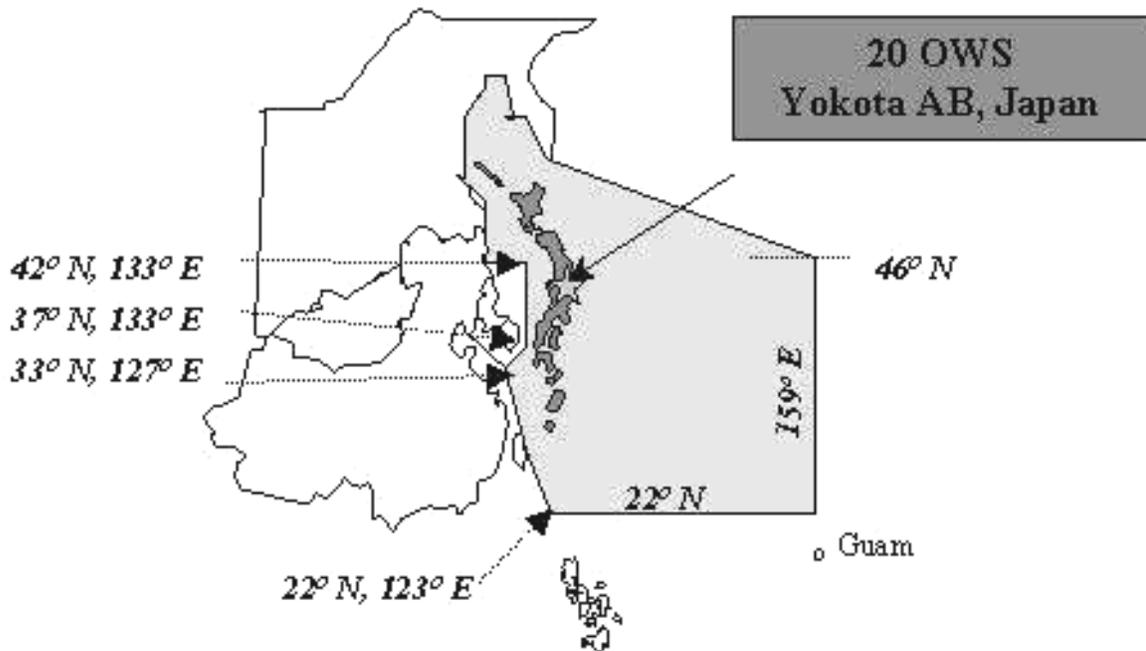
Figure 1.3. 17th OWS AOR.



**Under Command and Control of PACAF/AOG, in support of the 13<sup>th</sup> Air Force AOR.**

**17<sup>th</sup> OWS AOR:** China, Taiwan, Mongolia, Thailand, Vietnam, Laos, Cambodia, Burma, Malaysia, Singapore, India, Nepal, Sri Lanka, Bangladesh, Diego Garcia, Madagascar, Australia, New Zealand, Indonesia, New Guinea, Guam, Hawaii, tropical and subtropical Pacific including WESTPAC, and most of the Indian Ocean.

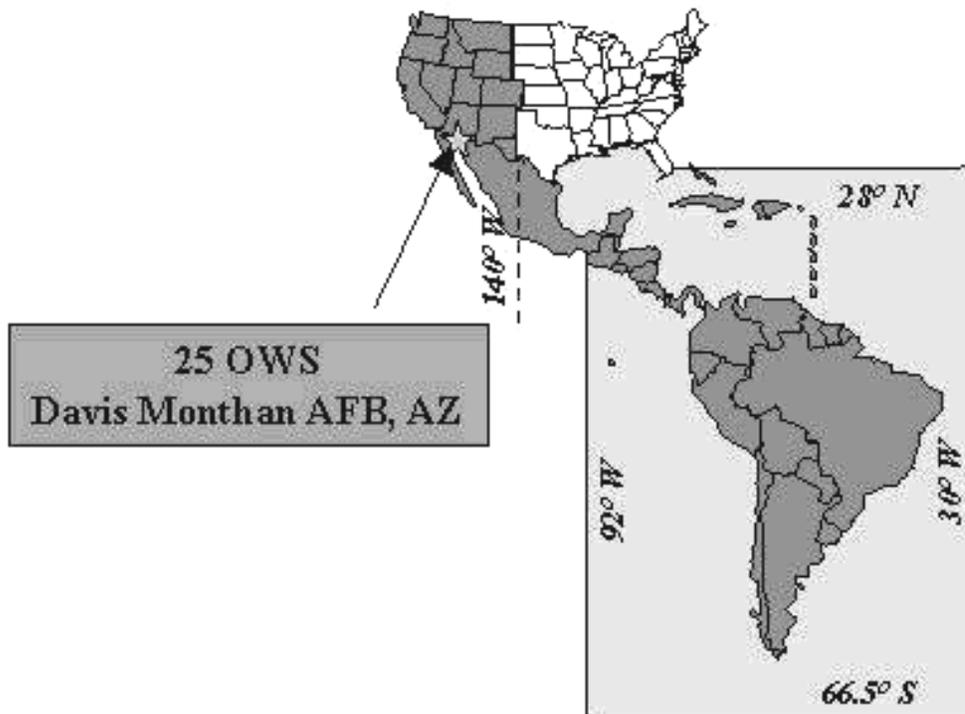
Figure 1.4. 20th OWS AOR.



**Under Command and Control of 605 AOG, in support of the 5<sup>th</sup> Air Force AOR.**

**20 OWS AOR: Japan, surrounding waters and part of the north Pacific Ocean.**

Figure 1.5. 25th OWS AOR.



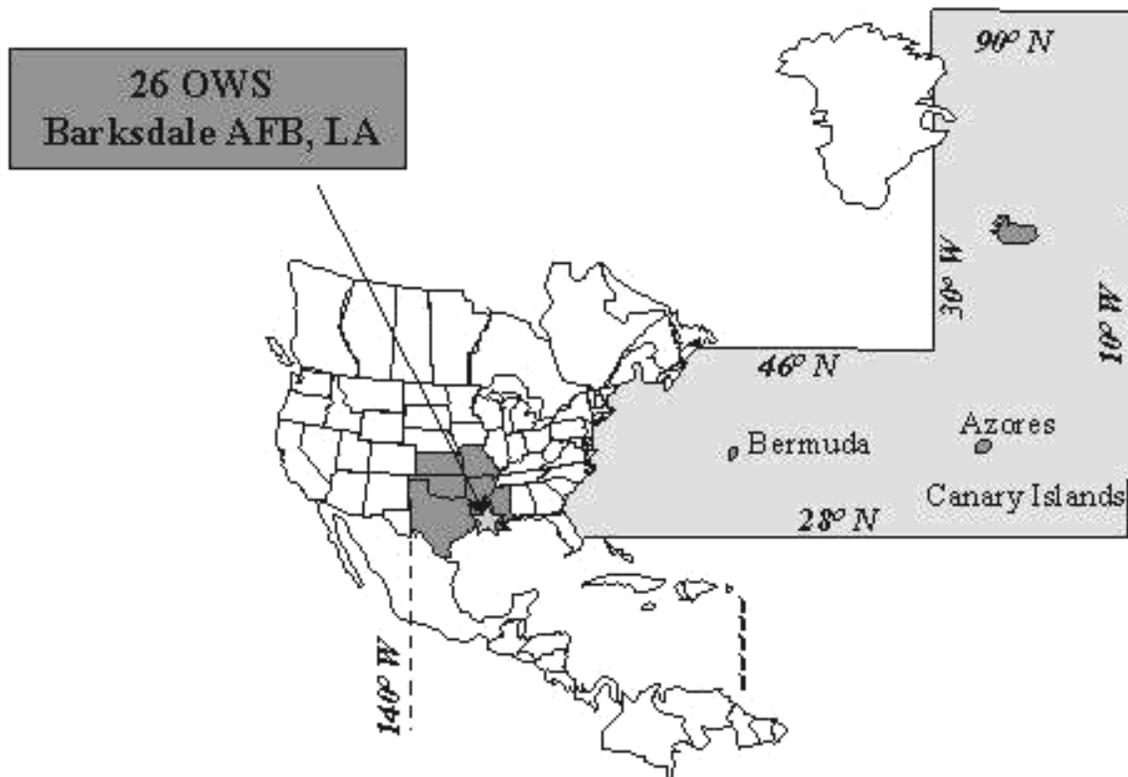
**Under Command and Control of 12AF, in support of USSOUTHCOM AOR.**

**25 OWS AOR:** WA, OR, CA, ID, MT, WY, CO, UT, NV, AZ, NM, and western panhandle of TX (west of 140 W); USSOUTHCOM AOR, including Mexico, Central & South America, Gulf of Mexico and Caribbean Basin - including the Bahama Islands.

\*Exceptions:

- 1) 25 OWS provides support to 90<sup>th</sup> Space Wing (F.E. Warren AFB) assets within the 15 OWS AOR.
- 2) 25 OWS AOR extends out to the US Air Defense Identification Zone (ADIZ), approximately 200 miles off the U.S. West coasts.

Figure 1.6. 26th OWS AOR.



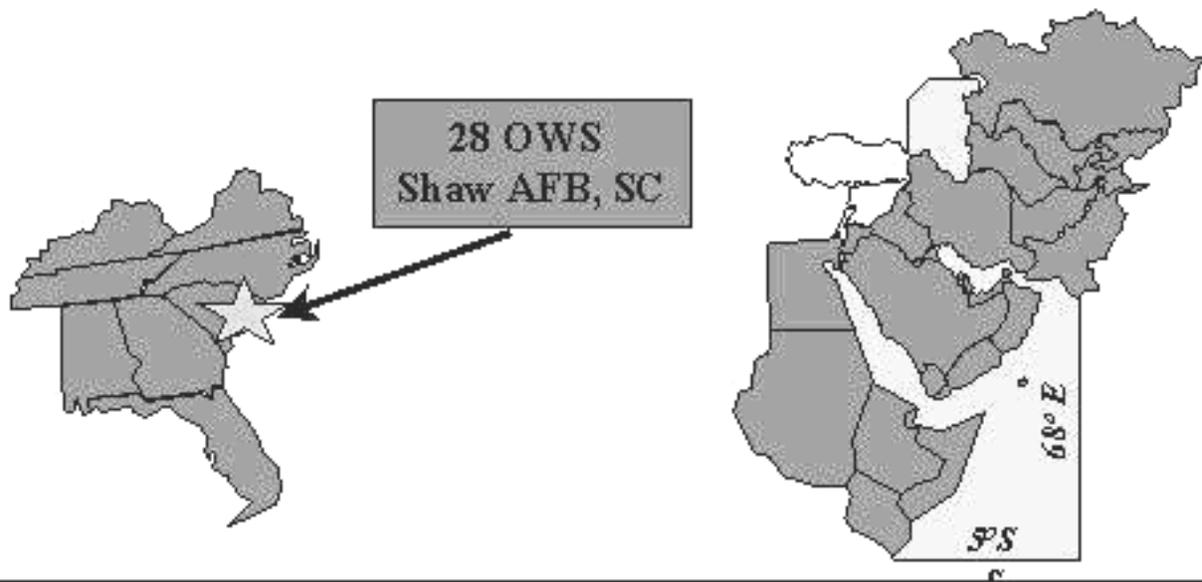
**Under Command and Control of 8AF, in support of USJFCOM AOR.**

**26 OWS AOR:** KS, MO, OK, AR, LA, MS, TX (except western panhandle); a portion of USJFCOM AOR to include Bermuda, Iceland, Lajes and a portion of Atlantic Ocean.

\* Exception:

26 OWS AOR extends out to the US Air Defense Identification Zone (ADIZ), approximately 200 miles off the TX, LA and MS coasts.

Figure 1.7. 28th OWS AOR.



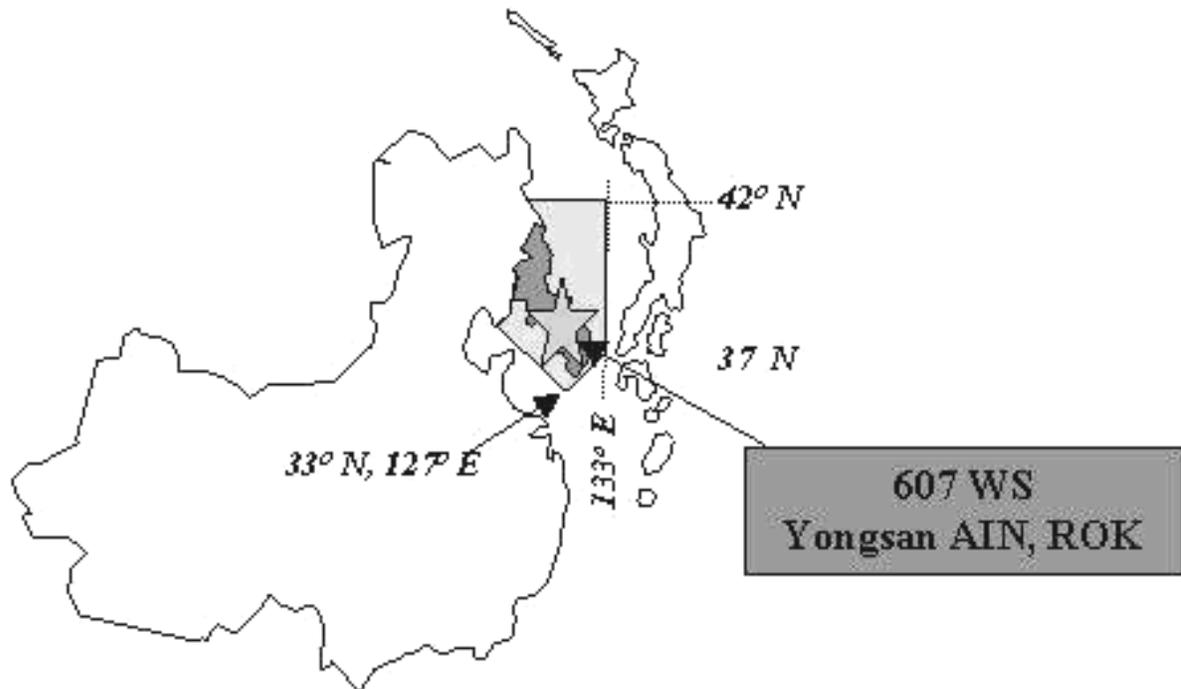
**Under Command and Control of 9AF, in support of USCENTCOM AOR.**

**28 OWS AOR:** KY, TN, AL, VA\*, NC, SC, GA, FL (including Florida Keys), USCENTCOM AOR - Pakistan, Afghanistan, Iran, Iraq, Jordan, Saudi Arabia, Kuwait, Bahrain, Qatar, United Arab Emirates, Oman, Yemen, Persian Gulf, Red Sea, Egypt, Sudan, Ethiopia, Kenya, Eritrea, Djibouti, and Somalia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan, and Caspian Sea.

**\* Exceptions:**

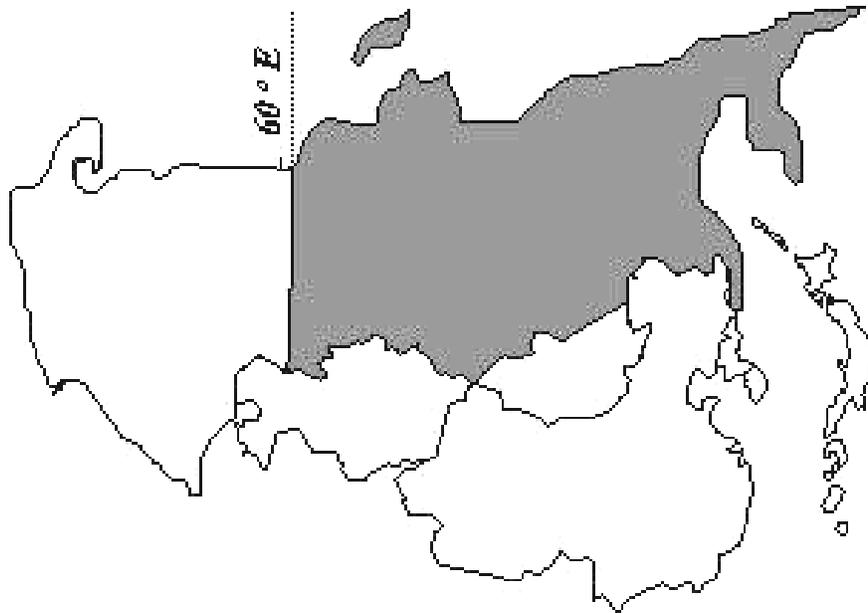
- 1) 15 OWS supports the Washington D.C. area.
- 2) 28 OWS AOR extends out to the US Air Defense Identification Zone (ADIZ), approximately 200 miles off the VA, NC, SC, FL, and AL coasts.

Figure 1.8. 607th WS AOR.



**Under Command and Control of 607 ASOG, in support of 7<sup>th</sup> Air Force AOR.**  
**607 WS AOR:** North and South Korea, and surrounding waters.

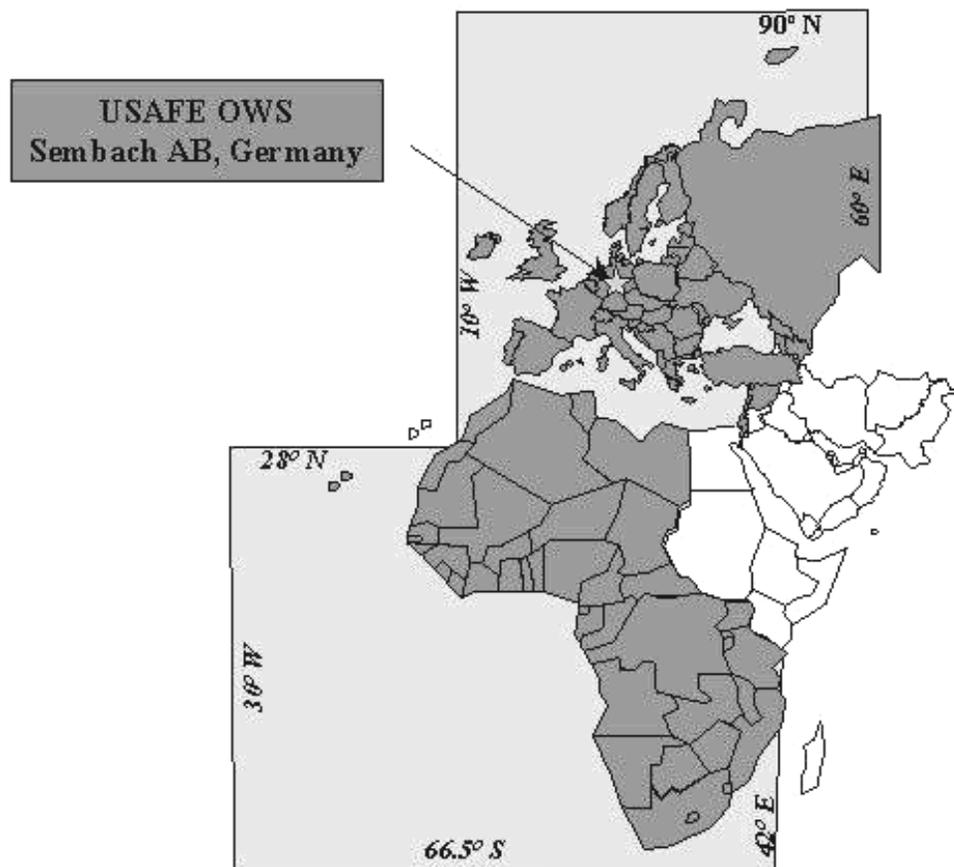
Figure 1.9. AFWA AOR.



**Under Command and Control of AF/XOW, in support of USSOCOM and National Programs.**

**AFWA AOR:** Russia east of 60<sup>0</sup> E (Ural Mountains) - Siberia, and global as required.

Figure 1.10. USAFE OWS AOR.



**Under Command and Control of USAFE/DO, in support of USAFE and USEUCOM AOR.**

**USAFE OWS AOR** - The USEUCOM AOR to include the following nations in Europe: Albania, Andorra, Armenia, Austria, Azerbaijan, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Georgia, Germany, Greece, Hungary, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Moldova, Monaco, Netherlands, Norway, Poland, Portugal, Romania, Russia (west of 60° E - Ural Mts), San Marino, Serbia and Montenegro, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom, Vatican City, Baltic Sea, Mediterranean Sea, Black Sea, Cyprus, Turkey, Syria, Lebanon, Israel,

In Africa: Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Congo, Cote D'Ivoire, Democratic Republic of the Congo, Equatorial Guinea, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Lesotho, Liberia, Libya, Malawi, Mali, Mauritania, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, South Africa, Swaziland, Tanzania, Togo, Tunisia, Uganda, Zambia, and Zimbabwe.

1.2.3. Tactical Level. AFW support to operational USAF and USA field units is organized for tactical, mission-specific operations. A Combat Weather Team (CWT) is a generic term used to describe a weather team that provides mission tailored weather products and services to a supported unit in garrison or at a deployed location. CWTs are normally organized as Weather Flights (WF) under Operational Support Squadrons (OSS) for USAF operations, or may be organized as Detachments (Det) or Combat Weather Squadrons (CWS) under Air Support Operations Groups (ASOG) for USA opera-

tions. During contingencies, CWTs deploy with operational warfighters. In addition, the 10th Combat Weather Squadron in support of US Army Special Operations Command (USASOC), the 30th Weather Squadron in support of the Western Missile Test Range, and the 45th Weather Squadron in support of the Eastern Missile Test Range have unique mission responsibilities. In addition, select weather field units perform unique space weather missions. Nonetheless, the CWT is the cornerstone of AFW support to operational field unit mission activities.

1.2.4. Air National Guard (ANG) and Air Reserve Component (ARC) weather resources will primarily support Air Force and Army active and reserve wartime deployment and employment requirements. Selected ARC resources will support rotational (i.e., Aerospace Expeditionary Force (AEF)) taskings on a volunteer basis and sustainment missions as active duty or mobilization requirements dictate. All ARC personnel will be trained and equipped to the same level as their active duty counterparts. To the maximum extent possible, ARC personnel will train with and support their wartime units.

1.2.5. AFW is organized to plan and execute weather operations the same in peacetime as during war and operations other than war.

1.2.6. HQ USAF/XOW serves as functional manager for AFW. As functional manager the XOW staff oversees USAF-wide training, organizing, and equipping of AFW units. This includes the following functions that are applicable across AFW:

1.2.6.1. Develops policies and procedures for weather operations and AFW readiness.

1.2.6.2. Defines system requirements.

1.2.6.3. Manages AFW-wide resources and training.

1.2.6.4. Serves as chair of the Weather Products Standardization Board (WPSB) in accordance with (IAW) AFMAN 15-129. The WPSB stands to insure a standardized and complementary suite of OWS- and AFWA- produced weather products and web pages exist to support worldwide operations.

1.2.7. MAJCOM weather staffs will:

1.2.7.1. Provide staff weather support to its MAJCOM.

1.2.7.2. Coordinate and define OWS metrics programs and ensure supported MAJCOMs and base/post customers have access to metrics data to evaluate the quality of OWS and CWT weather support.

1.2.7.3. Review and assist in the development of Memoranda of Agreement (MOAs) detailing weather support requirements between OWSs and supported CWTs.

1.2.7.4. Coordinate curtailment, discontinuance or significant changes of OWS weather services or products with affected MAJCOMs.

1.2.7.5. Augment OWS technical visits to supported CWTs as required.

1.2.7.6. Develop and crossfeed regional technical training materials on its AORs.

1.2.7.7. Provide technical training assistance to CWTs upon request.

## Chapter 2

### STRATEGIC WEATHER CENTERS

**2.1. Air Force Weather Agency Roles.** AFWA is AFW's principal strategic center and Department of Defense (DoD) Center of Excellence for Meteorological Satellite (METSAT) imagery. AFWA plans and produces global-scale weather products and centralized space weather products, and provides dedicated strategic weather and space environment forecast support to Special Operations and National Programs. AFWA also plans, programs and budgets for AFW standardized procedures, equipment, and training; plans and manages end-to-end, worldwide AFW communications networks; directly evaluates the technical health of AFWA subordinate units, and assists MAJCOMs with evaluation of the technical health of MAJCOM units when requested.

#### **2.2. Air Force Weather Agency Responsibilities:**

2.2.1. Collects, analyzes, processes, and formats global weather data and products for further distribution and access. Develops, acquires, evaluates, maintains, operates, and provides regional, theater-scale numerical weather prediction (NWP) meteorological models output, gridded databases and visualizations to operational and tactical-level weather units. Provides specialized weather products and services upon request IAW AFI 15-118, *Requesting Specialized Support*.

2.2.2. Uses National Oceanographic Atmospheric Administration (NOAA), Federal Aviation Agency (FAA), U.S. Navy (USN), USA, university and the scientific community (domestic and international) innovations for global weather model output, space weather data, weather equipment, forecasting techniques, and mesoscale weather prediction models. Incorporates these new data sources, techniques, tools and equipment into its operation to improve its strategic-level forecasting capability.

2.2.3. Provides global upper-air analyses and forecast products to operational and tactical-level AFW agencies.

2.2.3.1. Produces, amends, and disseminates global-scale visualizations depicting forecast positions of surface weather features (e.g., fronts and pressure systems) for 6 to 10 days into the future.

2.2.3.2. Produces, amends, and disseminates Military Weather Advisory (MWA) visualizations depicting forecast areas of severe thunderstorms (winds 50 knots and/or hail 3/4 inch or greater), moderate thunderstorms (winds 35-49 knots and/or hail 1/2 - 5/8 inch), general thunderstorms (winds less than 35 knots and/or hail less than 1/2 inch), nonconvective surface winds 35 knots or greater tornadoes, freezing rain, and excessive rain or snow (2 inches or greater in 12 or less hours) in the Continental United States (CONUS).

2.2.4. Provides CONUS severe weather discussions, analysis and forecast products.

2.2.5. Issues and disseminates Strategic-level weather threat assessments to OWSs and CWTs for evaluation, further dissemination, and initiation of appropriate actions.

2.2.6. Meshes selected, standardized OWS-produced regional visualizations to form standardized AFWA hemispheric visualizations to provide an integrated picture of global weather features.

2.2.6.1. Maintains standardized AFWA hemispheric visualizations IAW AFMAN 15-129.

2.2.6.2. Recommends changes to standardized AFWA visualizations through the WPSB defined in AFMAN 15-129.

- 2.2.6.3. Serves as co-chair to the WPSB.
- 2.2.7. Processes and provides tailored METSAT imagery to operational and tactical AFW units and other centers.
- 2.2.8. Provides space weather products and support.
  - 2.2.8.1. Acquires, manages, and maintains space weather databases.
  - 2.2.8.2. Operates space weather models and use output to produce space weather products and forecasts.
  - 2.2.8.3. Provides space weather support to organizations in the USAF, USA, USN, and DoD.
    - 2.2.8.3.1. Analyzes, monitors, and disseminates space weather observations and other weather from ground and space-based sensors.
    - 2.2.8.3.2. Provides specification products describing current conditions of the ionosphere and magnetosphere.
    - 2.2.8.3.3. Produces, monitors, and amends forecasts for solar flares, geomagnetic activity, radio signals and other space weather phenomena.
    - 2.2.8.3.4. Issues, monitors, and amends warnings for solar particle events, short wave fades due to solar flares, solar bursts, geomagnetic storms and other ionospheric and magnetospheric disturbances.
    - 2.2.8.3.5. Evaluate the space environment and provides system anomaly assessments.
  - 2.2.8.4. Tailors space weather products for specific regional commanders', planners', or operators' needs.
  - 2.2.8.5. Provides specialized space weather products and services upon request IAW AFI 15-118, *Requesting Specialized Support*.
  - 2.2.8.6. Jointly produces space weather products with NOAA Space Environmental Center (SEC).
  - 2.2.8.7. Operates and manages the Solar Electro-Optical Network (SEON).
  - 2.2.8.8. Provides backup capability to NOAA's SEC.
- 2.2.9. Provides tropical cyclone position and intensity estimates for the Joint Typhoon Warning Center (JTWC), National Hurricane Center (NHC), and Central Pacific Hurricane Center (CPHC).
- 2.2.10. Provides weather support to classified National Programs as directed by the Secretary of the Air Force.
- 2.2.11. Provides worldwide, mission-tailored forecasts to USAF, USA, and USN Special Operations Forces.
- 2.2.12. Provides weather data (observations and forecasts) to appropriate agencies running Nuclear, Biological, and Chemical (NBC) dispersion models for NBC consequence assessments in the CONUS and its Outside Continental United States (OCONUS) AOR.
- 2.2.13. Provides Effective Downwind Messages (EDMs) for CONUS and OCONUS, as required.

- 2.2.14. Provides weather data, OWS product information, and forecasts for American Forces Radio and Television Services (AFRTS) broadcasts.
- 2.2.15. Provides backup capability for aviation weather products for the National Weather Service's (NWS) Aviation Weather Center (AWC), severe weather products for the Storm Prediction Center (SPC), and NWP outputs, and volcanic ash dispersion forecasts for the National Center for Environmental Prediction (NCEP).
- 2.2.16. Provides backup capability to JTWC Satellite Operations in coordinating tropical cyclone reconnaissance for the Pacific Tropical Cyclone Reconnaissance Network in the event of an outage at JTWC.
- 2.2.17. Directs the acquisition, configuration management, modification, logistics, funding and life cycle support of all standard (dedicated) weather communications systems.
- 2.2.18. Acquires, manages, distributes global environmental data, via the Automated Weather Network (AWN), Global Weather Intercept Program (GWIP), Automatic Digital Weather Switch (ADWS), Advance Meteorological Information System (AMIS) and Very Small Aperture Terminals (VSATs). This includes submitting AF Form 525, **Records Disposition Recommendation** and AF Form 1341, **Electronic Record Inventory** to the National Archives and Records Administration when systems have an electronic record keeping systems.
- 2.2.19. Directs the planning, programming, budgeting, development, acquisition, engineering, configuration management, modification, installation, integration, logistics, funding and life cycle support of all standard USAF-provided weather (equipment) systems. Also coordinates requirements and development of weather systems by USA.
- 2.2.20. Manages AFW communications programs interfacing with common user systems; coordinates activities with USAF, USA, USN, DoD, and MAJCOM and associated federal civilian weather agencies.
- 2.2.21. Provides and maintains the Joint Air Force and Army Weather Information Network (JAAWIN) and Secure JAAWIN (SJAAWIN).
- 2.2.21.1. Maintains a homepage in the public domain containing selected JAAWIN products.
- 2.2.21.2. Processes foreign national requests for access to AFW systems IAW AFI 33-202, *Computer Security* and local directives.
- 2.2.22. Coordinates foreign nations' requests for weather data, satellite imagery, technical information and software tools through appropriate Air Staff, MAJCOM, AFW's Foreign Disclosure Officer (FDO), and Scientific and Technical Information Officer (STINFO).
- 2.2.23. Develops, manages, standardizes and coordinates AFW-wide training programs and requirements.
- 2.2.24. Manages aerospace sciences and technology exploitation activities to enhance AFW capabilities and operations.
- 2.2.25. Manages AFW Standardization and Evaluation Programs IAW AFI 15-180, *Air Force Technical Standardization and Evaluation Program*.
- 2.2.26. Manages AFW Metrics Programs IAW AFI 15-114, *Weather Support Evaluation*.

**2.3. Air Force Combat Climatological Center Roles:** Air Force Combat Climatology Center (AFCCC) is assigned to AFWA and provides centralized climatological database services and produce specialized weather-impact information for DoD and allied nations.

**2.4. Air Force Combat Climatological Center Responsibilities:**

- 2.4.1. Provides and archives centralized weather and climatological database services.
- 2.4.2. Reviews NOAA, USN, and foreign national climatological data resources for application to the aerospace mission.
- 2.4.3. Provides statistical weather, space weather, and climatological studies for engineering design, weapons systems employment, and operational planning purposes.
- 2.4.4. Operates and manages the Air Force Weather Technical Library (AFWTL).
- 2.4.5. Provides 10-day to 12-month long-range weather planning outlooks upon request.
- 2.4.6. Operates specialized models to support National Programs.
- 2.4.7. Archives critical weather and space environment effects data for friendly and enemy weapons systems.

**2.5. Air Force Combat Weather Center Roles:** Air Force Combat Weather Center (AFCWC) is assigned to AFWA and develops techniques, procedures, operational concepts, and transition technology to CWTs.

**2.6. Air Force Combat Weather Center Responsibilities:**

- 2.6.1. Plans and provides innovative combat weather Techniques, Tactics, and Procedures (TTP) for AFW personnel supporting USAF and USA operations.
  - 2.6.1.1. Identifies, evaluates, and develops TTP and technical solutions to AFW combat weather readiness issues.
  - 2.6.1.2. Provides selective training, testing, evaluations, and proofs of concepts for AFW systems.
- 2.6.2. Serves on Army's Software Configuration Control Board (CCB) for Army tactical weather systems and serves on Army weather equipment New Equipment Training Teams.

**2.7. Joint Typhoon Warning Center Roles:** JTWC is a consolidated USAF and USN agency specializing in tropical cyclone reconnaissance and forecasting tropical cyclone tracks and intensities.

**2.8. Joint Typhoon Warning Center Responsibilities:**

- 2.8.1. The AF is solely responsible for the tropical cyclone reconnaissance function.
- 2.8.2. JTWC's AOR extends from 180 degrees, westward to the east coast of Africa in the Northern Hemisphere and from South America to the east coast of Africa in the Southern Hemisphere.
- 2.8.3. JTWC tailors information for DoD use from the CPHC and NHC products in the North Hemisphere region east of 180 degrees.
- 2.8.4. Specific JTWC roles and responsibilities are defined in USCINCPACINST 3140.1.

## Chapter 3

### OPERATIONAL WEATHER SQUADRONS

**3.1. Roles:** Each OWS is assigned an AOR and is responsible for arranging and providing operational-level aerospace weather support to operational units assigned within and/or deployed into its AOR. The OWS provides theater-scale battlespace forecasts, drop zone/range/AR forecasts, fine-scale target forecasts, and issue weather warnings and terminal forecasts for Air Force and Army installations within their area of responsibility (AOR). They will also provide mission weather briefings to Numbered Air Force (NAF) and Echelon Above Corps (EAC) decision-makers and transient aircrews operating at installations within their AOR.

#### **3.2. Responsibilities:**

3.2.1. Conducts a Meteorological Watch (METWATCH) within its AOR and amends OWS products when specified amendment criteria are met.

3.2.2. Produces, disseminates and amends all Aerodrome Forecasts (TAFs) for USAF, USA and contingency airfields within its AOR using general flight rule criteria in AFI 11-202, (Volume 3), *General Flight Rules*, AR 95-1, *Flight Regulations* and any additional criteria required to support flight operations at the airfield.

3.2.2.1. Receives requests and additional amendment criteria for TAFs from CWTs. If the NWS or another weather service issues a TAF for an airfield and that TAF meets the supported units requirements, then the OWS will not be required to issue a separate TAF.

3.2.2.2. Produces, disseminates and amends TAFs for Reserve Components (RC) airfields within its AOR when there is no other forecasting support (i.e. CWT, NWS, another weather service) available, as required.

3.2.2.3. Discusses and coordinates with the CWT the meteorological reasoning and content of the TAF.

3.2.2.4. Issues and disseminates amended TAFs when amendment criteria are met. The CWT should notify the OWS if a TAF requires amending.

3.2.3. Produces, disseminates and amends MWA visualizations depicting forecast areas of convective winds 50 knots and greater, nonconvective winds 35 knots and greater, 3/4 inch or greater hail, tornadoes, freezing rain, and excessive rain or snow for its OCONUS AOR.

3.2.4. Produces, disseminates and amends all forecast Weather Watches (WATCH), Weather Warnings (WW) and Weather Advisories (WA) for active duty and RC installations within its AORs using criteria IAW AFI 10-229, *Responding to Severe Weather Events* and AFMAN 15-129, *Aerospace Weather Operations - Processes and Procedures* or additional criteria requested by the supported unit.

3.2.4.1. Produces, disseminates and amends observed WA and WW, if possible, when a CWT is not on duty, as assigned.

3.2.4.2. Receives, evaluates and processes all AFWA issued Strategic-level weather threat assessments for its AOR.

3.2.5. Produces, disseminates, METWATCH and amends standardized flight hazards visualizations for the AOR. Regional flight hazard visualizations depict regional and smaller scale areas of forecasted icing, turbulence, thunderstorms and cloud cover from the surface to 50,000 feet.

3.2.6. Produces and disseminates standardized visualizations depicting observed and forecast regional-scale surface weather features, precipitation areas, cloud and visibility depictions from the current analysis to 5 day prognostications.

3.2.6.1. Analyzes 00 Universal Time Coordinate (UTC) and 12 UTC (minimum frequency) regional surface and upper air weather observations, and disseminates analyses.

3.2.6.2. Produces standardized regional and theater-unique weather products and visualizations that are technically consistent with other weather products and visualizations.

3.2.6.3. Produces standardized OWS regional visualizations IAW AFMAN 15-129.

3.2.6.4. Recommends changes to standardized OWS visualizations through the WPSB process defined in AFMAN 15-129.

3.2.6.5. Serves as member on the WPSB.

3.2.6.6. Produces and disseminates current satellite analyses of its AOR.

3.2.7. Produces, disseminates, METWATCH, and amends Military Operating Area Forecasts (MOAF) for its AOR. MOAFs provide forecast guidance for Air Refueling (ARs) tracks, Drop Zones (DZs), Landing Zones (LZs), target areas, forward area refueling points (FARPs), combat maneuver areas, instrument/low level routes, tactical ranges, and gunnery ranges. CWTs uses MOAFs to make mission execution forecasts.

3.2.8. Reviews, evaluates and uses USN and host nation weather forecast products for maritime/oceanic areas within an AOR where applicable.

3.2.9. Provides gridded data fields from post-processing model data output for its AOR to CWTs and AF and Army command and control units when requested.

3.2.10. Interrogates weather radar data returns for significant weather features (e.g., severe weather indicators) within its AOR.

3.2.10.1. Analyzes weather radar data displays IAW AFMAN 15-113, *Weather Radar Observations* and Federal Meteorological Handbooks (FMH) 7 and 11.

3.2.10.2. Participates as the USAF voting member on the Unit Radar Committee (URC) for NWS controlled Weather Surveillance Radar - 1988 Doppler (WSR-88D) in its AOR IAW FMH 11. OWS may request the local CWT to represent the OWS at the URC.

3.2.11. Provides direct staff weather support to its NAF commander and staff; provides indirect staff support and weather products to theater CINC, Joint Task Force (JTF), and components as required.

3.2.12. Provides flight weather briefings to transient aircrews, RC aircrews not collocated with a CWT, deployed aircrews without a designated CWT and when a CWT is not present for the aircrew.

3.2.13. Provides, as resources allow, output from tactical decision aids, to RC units not collocated with CWT.

- 3.2.14. Provides weather data to airborne aircrews within its AOR via Pilot-to-Metro Service (PMSV) radio, phone patch, Satellite Communication (SATCOM), L-Band, or other modes of communication.
- 3.2.15. Acquires, analyzes, evaluates and disseminates Pilot Reports (PIREPS) and Air Reports (AIREPS).
- 3.2.16. Provides weather data (observations and forecast) to appropriate agencies running DoD NBC dispersion models for NBC consequence assessments in its OCONUS AOR.
- 3.2.17. Provides or arranges for EDM and Chemical Downwind Messages (CDM) for CONUS and OCONUS AORs, as required.
- 3.2.18. Coordinates and maintains detailed documentation/agreements (e.g., Weather Support Documents (WSD), Memorandum of Agreement (MOA)) that define specific terrestrial and space weather support requirements for each supported unit. Agreements may be documented in an Operations Plan, Unit/Agency Regulations IAW AFI 13-203, *Air Traffic Control* and AFI 13-213, *Airfield Management* or, in the case of cross-Command agreement, in a Memorandum of Agreement IAW AFI 25-201, *Support Agreements Procedures*.
- 3.2.19. Maintains a Non-Classified Internet Protocol Router Network (NIPRNET) and SECRET Internet Protocol Router Network (SIPRNET) homepage containing weather data and products for its AOR.
- 3.2.20. Acquires, disseminates and/or posts space weather data and products on their homepages and/or other communication links for use by units within its AOR.
- 3.2.21. Coordinates requests from foreign nations for weather data, satellite imagery, technical information (e.g. techniques, algorithms) and software tools through appropriate MAJCOM staff, Air Staff, and AFW's FDO and STINFO.
- 3.2.22. Develops capability to allow foreign national access to AFW systems IAW AFI 33-202, *Computer Security* and local directives, as well as applicable foreign disclosure directives on releasability of data to foreign nationals.
- 3.2.23. Training:
- 3.2.23.1. Provides initial qualification and upgrade training for enlisted weather apprentices and new officer accessions.
  - 3.2.23.2. Provides recurring training to assigned personnel.
  - 3.2.23.3. Develops meteorological technical training/assistance materials for its AORs and makes them available to outside agencies.
  - 3.2.23.4. Develops a CWT orientation program in coordination with MAJCOM.
- 3.2.24. Develops metric programs and provides metrics information and reports IAW AFI 15-114, *Weather Support Evaluation*.
- 3.2.25. Develops and maintains a technical library and Forecast Reference Notebooks (FRN) for forecast locations within its AORs. Updates to the FRNs will be sent to the applicable CWTs.

3.2.26. Notifies its MAJCOM weather staff, AFWA, HQ USAF/XOW and supported units in AFW when an OWS is not operational or experiencing an outage. The notification shall include what unit is the back up and an estimated time for recovery.

3.2.27. Develops a coordinated plan to continue providing operational-level weather support during outages and evacuation of the OWS facilities.

## Chapter 4

### COMBAT WEATHER TEAMS

**4.1. Roles:** CWTs provide or arrange tactical-level weather support for assigned USAF and USA units in-garrison and deployed. They provide weather and solar observations and mission execution forecasts (MEF) for tactical and in-garrison operations. CWTs apply meteorology and space physics to the specific needs of operational missions, translating weather and space weather conditions into operational mission impacts. They interface with field commanders, planners, and operational personnel, reaching back to an OWS for centralized weather products, then tailoring the products to develop MEFs for the supported units.

#### 4.2. Responsibilities:

4.2.1. Takes, records and disseminates surface weather observations in support of military operations IAW AFMAN 15-111, *Surface Weather Observations*.

4.2.1.1. Augments automated surface observing systems, when required IAW AFMAN 15-111, *Surface Weather Observations*. Augmentation by certified weather personnel is mandatory at USAF and USA controlled airfields with an assigned CWT when any of the following criteria are met:

4.2.1.1.1. The Air Traffic Control (ATC) tower located on the airfield is open to support military flight operations.

4.2.1.1.2. A weather watch or warning IAW AFI 10-229, *Responding to Severe Weather Events* is issued for the airfield.

4.2.1.1.3. Volcanic ash is observed from the airfield.

4.2.1.2. Arranges shipment of battlefield observations (e.g., Artillery (ARTY), Forward Area Limited Observing Program (FALOP), and Remote Miniature Weather Information System (RMWIS) back to the supporting OWS via classified means.

4.2.1.3. CWTs shall not take, record, or disseminate a separate observation if the NWS or a host nation is responsible for the official airfield observation.

4.2.1.3.1. CWTs may supplement the official airfield observation with weather parameters not included in the observation (e.g., altimeter).

4.2.1.3.2. CWTs shall document all supplemental support to the official airfield observation in the local weather support document.

4.2.2. Provides solar observations IAW AFMAN 15-162, *Space Weather Observations*, if equipped as a solar observing site. Disseminates observations to AFWA and appropriate agencies to provide space weather forecasts, warnings, and support.

4.2.3. Provides upper air observations IAW AFMAN 15-112, *Upper Air Observations*, if equipped with upper air observing equipment. Disseminate observations to AFWA and the appropriate OWS to supplement other upper air observations or provide observation in data sparse regions.

4.2.4. Provides weather radar observations IAW AFMAN 15-113, *Weather Radar Observations*, if equipped with weather radar equipment.

4.2.5. Provides Mission Execution Forecasts (MEFs) in support of all operational and installation support activities as coordinated and required. CWTs use the Mission Execution Forecast Process described in AFMAN 15-129, *Aerospace Weather Operations* to develop the MEFs.

4.2.5.1. CWTs use TAFs for the takeoff, landing, and alternate airfield information for the MEF. The MEF takes into account takeoff and landing weather thresholds for specific aircraft, pilot category or mission. The airfield forecast in the MEF must be within the same cloud ceiling and visibility forecast category as TAF, except if flight safety is jeopardized and the TAF can not be amended in time. The CWT must coordinate differences with the OWS issuing the TAF.

4.2.5.2. CWTs use forecast weather guidance from MOAF to make mission-specific forecasts for the MEF.

4.2.6. Provides tailored weather effects products from Tactical Decision Aids (TDAs) and Integrated Weather and Environment Decision Aid (IWEDA) to predict go/no go weather thresholds.

4.2.7. Interprets and applies space weather data and forecasts to support their customers' missions. This includes alerting their customers to the impacts of space weather on their operations, weapons and communication systems.

4.2.8. Conducts a Mission Watch (MISSIONWATCH) for supported customers' flying areas, routes and flights throughout the mission.

4.2.8.1. Serves as the "eyes" forward for the OWS. Provides the OWS real-time interpretation of local weather information, including from local weather offices and weather spotters. Notifies the OWS when OWS forecasts require amendment based on established criteria. The CWT designates a single member who is responsible for contacting and coordinating with the OWS.

4.2.8.2. Notifies the OWS if the TAF must be amended immediately.

4.2.8.3. Issues a weather warning if weather imminently threatens life or property and there is insufficient time for the OWS to issue the weather warning. The CWT gives top priority to notifying the necessary units on the installation followed immediately by notifying the OWS.

4.2.9. Uses fixed or tactical weather radars to support MISSIONWATCH of supported base/post operations and customer flying areas, routes and missions. Provides the OWS forecaster real-time interpretation of radar data when the same data is not available to the OWS (e.g., units with a deployed tactical weather radar).

4.2.10. Issues, amends and cancels all observed weather advisories and observed lightning warnings for their location during CWT operating hours.

4.2.11. Develops procedures to assemble a Severe Weather Action Team IAW AFI 10-229, *Responding to Severe Weather* and AFMAN 15-129, *Aerospace Weather Operations*.

4.2.12. Provides or arranges weather briefings. For large force employment missions, with force packages from different locations, the weather unit supporting the Command and Control (C2) Element will act as lead for planning purposes. The lead weather unit coordinates with all other weather units to ensure a coordinated and common weather forecast is available to build the MEFs to support the mission.

4.2.13. Provides weather data to airborne aircrews via PMSV radio, phone patch, SATCOM, L-Band, or other modes of communication.

- 4.2.14. Acquires, analyzes, evaluates and disseminates PIREPS and AIREPS.
- 4.2.15. Provides or arranges staff, mission planning, and mission execution weather support to assigned commanders and units in-garrison and at deployed locations.
  - 4.2.15.1. Coordinates with other MAJCOM CWTs operating from the same in-garrison or deployed location to ensure weather support is consistent and weather support functions are not duplicated by the other CWT.
    - 4.2.15.1.1. The CWT assigned to the installation or supporting the host unit provides the surface weather observations and issues observed weather warnings and watches for the installation.
    - 4.2.15.1.2. Each CWT is responsible for providing or arranging support to its assigned supported unit.
  - 4.2.15.2. Deploys with supported units to provide direct weather support, as required.
  - 4.2.15.3. Arranges weather support to assigned unit if a CWT does not deploy with supported unit.
- 4.2.16. Provides meteorological parameters to installation disaster control agencies, as required.
- 4.2.17. Provides or arranges CDM support to installation agencies, as required.
- 4.2.18. Coordinates with appropriate base or post agencies and parent command to arrange installation and maintenance of a web-based aircrew weather briefing system in operations/flight planning area(s) for transient aircrews to obtain weather data from the appropriate OWS.
- 4.2.19. Develops a plan to relocate the CWT from normal work centers and continue weather operations in the event the work center is evacuated.
- 4.2.20. Provides metrics information and reports IAW AFI 15-114, *Weather Support Evaluation*.
- 4.2.21. Performs qualification, upgrade, continuation and mobility training to ensure all personnel can achieve and maintain the required USAF and USA proficiency IAW AFMAN 15-129.
  - 4.2.21.1. Ensures assigned personnel receive CWT orientation program that focuses on in-garrison and deployed location forecast and support processes.
  - 4.2.21.2. Ensures assigned personnel receive required training to understand and support the supported units' missions and weapons systems.
- 4.2.22. Complies with Air Force Weather Standardization and Evaluation Program IAW AFI 15-180, *Air Force Technical Standardization and Evaluation Program*.
- 4.2.23. Establishes procedures for operating and reporting outages of weather equipment and communications systems with the appropriate local and deployed maintenance units.
- 4.2.24. Coordinates requests from foreign nations for terrestrial and space weather data, satellite imagery, technical information and software tools through appropriate MAJCOM staff, Air Staff, and AFW's FDO and STINFO.
- 4.2.25. Documents local weather requirements in appropriate support documents or agreements and coordinates with its supporting OWS on how to best satisfy the requirements.

## Chapter 5

### SUPPORT TO AIR FORCE WEATHER UNITS

**5.1. Air Force Provided Support:** USAF parent units provide essential services to maintain weather operations. Specific USAF support includes:

5.1.1. Communications and Information (SC) agencies will provide and support weather units with NIPRNET and SIPRNET access, if required, IAW AFI 10-229, *Responding to Severe Weather Events*; AFI 33-101, *Communications and Information Management of Communication Electronics*; and AFI 33-104, *Base-Level Planning and Implementation*.

5.1.2. SC agencies will maintain weather communication circuits, computer systems, and meteorological equipment IAW AFI 21-116, *Maintenance Management of Communication Electronics*.

5.1.3. Installation commanders will provide weather advisory, watch, and warning notification service to appropriate on and off-base units IAW AFI 10-229, *Severe Weather Response*.

5.1.4. ATC agencies will maintain a Cooperative Weather Watch (CWW) program IAW AFMAN 15-111, *Surface Observations* and AFI 13-203, *Air Traffic Control*.

5.1.5. Base Operations or Airfield Management personnel will notify supporting CWT of changes to the runway condition and aircraft emergencies IAW AFI 13-213, *Air Traffic Control*.

5.1.6. Operational units will document requirements for weather, space environment, and climatological data and support in appropriate support documents. This includes criteria for watches, warnings, and advisories IAW AFI 25-201, *Support Agreement Procedures*.

5.1.7. Operational units will submit special, short term requirements for weather, space environmental and climatological data, products or support IAW AFI 15-118, *Requesting Specialized Weather Support*.

5.1.8. AFW personnel will be provided required mobility equipment IAW AFI 10-403, *Deployment Planning*.

5.1.9. Aircrews operating away from home base will schedule flight weather briefings with the appropriate OWS, preferably 12 or more hours prior to flight time.

**5.2. U.S. Army Provided Support:** USA provides essential services and equipment to maintain Army weather support operations performed by AFW personnel. Specific USA responsibilities are documented in AR 115-10/AFJI 15-157, *Weather Support For U.S. Army* and FM 34-81/AFJPAM 15-127, *Weather Support for U.S. Army Tactical Operations*.

MARVIN R. ESMOND, Lt General, USAF  
DCS/Air and Space Operations

**Attachment 1****GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION*****References***

Joint Pub 3-59, Joint Doctrine, Tactic, Techniques, and Procedures for Meteorological and Oceanographic Operations

USCINCPACINST 3140.1(series), Tropical Cyclone Operations Manual

AFDD 1, Air Force Basic Doctrine

AFMD 52, Air Weather Service

AFPD 15-1, *Atmospheric and Space Environmental Support*

AFPD 16-2, *Disclosure of Military Information to Foreign Governments and International Organizations.*

AFPD 61-2, *Management of Scientific and Technological Information*

AFI 10-229, *Responding to Severe Weather Events*

AFI 10-403, Deployment Planning

AFI 11-202 Vol.3, General Flight Rules

AFI 13-203, Air Traffic Control

AFI 13-213, Airfield Management

AFMAN 15-111, *Surface Weather Observations*

AFMAN 15-112, *Upper Air Observations*

AFMAN 15-113, *Weather Radar Observations*

AFI 15-114, *Weather Support Evaluation*

AFI 15-118, *Requesting Specialized Weather Support*

AFMAN 15-124, *Meteorological Codes*

AFMAN 15-125, *Weather Station Operations*

AFMAN 15-129, *Aerospace Weather Operations - Processes and Procedures*

AFJI 15-157, *Weather Support for the U.S. Army*

AFMAN 15-162, *Space Weather Observations*

AFMAN 15-180, *Air Force Weather Technical Standardization and Evaluation Program*

AFI 21-116, *Maintenance Management of Communications-Electronics*

AFI 25-201, *Support Agreements Procedures*

AFI 32-4001, *Disaster Preparedness Planning and Operations*

AFMAN 32-4004, *Emergency Response Operations*

AFI 33-101, *Communications and Information Management Guidance and Responsibilities*

AFI 33-104, *Base-Level Planning and Implementation*

AFI 33-202, *Computer Security*

AFMAN 37-139, *Records Disposition Schedule*

AFWAMD 5201, *Air Force Weather Agency (AFWA) Mission Directive*

AFWAMD 5203, *Air Force Combat Climatology Center Mission Directive*

AR 115-10/AFJI 15-157, *Weather Support for the U.S. Army*

AR 95-1, *Flight Regulations*

FM 34-81/AFJPAM 15-127, *Weather Support for U.S. Army Tactical Operations*

FMH 7, *Weather Radar Observations*

FMH 11, *Doppler Radar Meteorological Observations*

### ***Abbreviations and Acronyms***

**AB**—Air Base

**AEF**—Aerospace Expeditionary Force

**ADWS**—Automatic Digital Weather Switch

**AF**—Air Force

**AFB**—Air Force Base

**AFCCC**—Air Force Combat Climatology Center

**AFCWC**—Air Force Combat Weather Center

**AFI**—Air Force Instruction

**AFJI**—Air Force Joint Instruction

**AFMAN**—Air Force Manual

**AFMD**—Air Force Mission Directive

**AFPD**—Air Force Policy Directive

**AFRTS**—Armed Forces Radio and Television Service

**AFW**—Air Force Weather

**AFWA**—Air Force Weather Agency

**AFWAMD**—Air Force Weather Agency (AFWA) Mission Directive

**AFWTL**—Air Force Weather Technical Library

**AIN**—Army Installation

**AIREPS**—Air Reports

**AMC**—Air Mobility Command

**AMIS**—Advance Meteorological Information System

**ANG**—Air National Guard

**AOG**—Air Operations Group

**AOR**—Areas of Responsibility

**AR**—Air Refueling

**AR**—Army Regulation

**ARC**—Air Reserve Component

**ARNG**—Army National Guard

**ARTY**—Artillery

**ASOG**—Air Support Operation Group

**ATC**—Air Traffic Control

**AWC**—Aviation Weather Center

**AWN**—Automated Weather Network

**C2**—Command and Control

**CCB**—Configuration Control Board

**CDM**—Chemical Downwind Message

**CINC**—Commander in Chief

**CONUS**—Continental United States

**CPHC**—Central Pacific Hurricane Center

**CWS**—Combat Weather Squadron

**CWT**—Combat Weather Team

**CWW**—Cooperative Weather Watch

**Det**—Detachment

**DO**—Directorate of Operations

**DoD**—Department of Defense

**DZ**—Drop Zone

**E**—East

**EAC**—Echelon Above Corps

**EDM**—Effective Downwind Messages

**FAA**—Federal Aviation Administration

**FALOP**—Forward Area Limited Observing Program

**FARP**—Forward Area Refueling Point

**FDO**—Foreign Disclosure Officer

**FM**—Field Manual

**FMH**—Federal Meteorological Handbook

**FOA**—Field Operating Agency

**FRN**—Forecast Reference Notebook

**GWIP**—Global Weather Intercept Program

**HQ**—Headquarters

**IAW**—In Accordance With

**IWEDA**—Integrated Weather and Environment Decision Aid

**JAAWIN**—Joint Air Force and Army Weather Information Network

**JTF**—Joint Task Force

**JTWC**—Joint Typhoon Warning Center

**LZ**—Landing Zone

**MACOM**—Major Commands (Army)

**MAJCOM**—Major Command (Air Force)

**MOA**—Memoranda of Agreement

**MOAF**—Military Operating Area Forecast

**MEF**—Mission Execution Forecast

**METSAT**—Meteorological Satellite

**METWATCH**—Meteorological Watch

**MISSIONWATCH**—Mission Watch

**MWA**—Military Weather Advisory

**N**—North

**NAF**—Numbered Air Force

**NBC**—Nuclear, Biological and Chemical

**NCEP**—National Center for Environmental Prediction

**NHC**—National Hurricane Center

**NIPRNET**—Non-Classified Internet Protocol Router Network

**NOAA**—National Oceanographic and Atmospheric Administration

**NWP**—Numerical Weather Prediction

**NWS**—National Weather Service

**OCONUS**—Outside the Continental United States

**OSS**—Operational Support Squadrons

**OWS**—Operational Weather Squadron

**PACAF**—Pacific Air Forces

**PIREPS**—Pilot Reports

**PMSV**—Pilot to Metro Service

**RC**—Reserve Component

**RMWIS**—Remote Miniature Weather Information System

**S**—South

**SJAAWIN**—Secure Air Force and Army Weather Information Network

**SATCOM**—Satellite Communication

**SC**—Communications and Information

**SEC**—Space Environment Center

**SEON**—Solar Electro-Optical Network

**SIPRNET**—Secure Internet Protocol Router Network

**SPC**—Storm Prediction Center

**STINFO**—Scientific and Technical Information Officer

**SWO**—Staff Weather Officer

**TACC**—Tanker Airlift Control Center

**TAF**—Terminal Aerodrome Forecast

**TDA**—Tactical Decision Aids

**TTP**—Tactics and Procedures

**URC**—Unit Radar Committee

**USA**—United States Army

**USAF**—United States Air Force

**USAFE**—United States Air Forces in Europe

**USASOC**—United States Army Special Operations Command

**USCENTCOM**—United States Central Command

**USCINCPACINST**—United States Commander-In-Chief Pacific Command Instruction

**USEUCOM**—United States European Command

**USJFCOM**—United States Joint Forces Command

**USN**—United States Navy

**USSOCOM**—United States Special Operations Command

**USSOUTHCOM**—United States South Command

**UTC**—Universal Time Coordinate

**VSAT**—Very Small Aperture Terminal

**W**—West

**WA**—Weather Advisory

**WATCH**—Weather Watch

**WESTPAC**—Western Pacific Ocean

**WF**—Weather Flight

**WPSB**—Weather Product Standardization Board

**WS**—Weather Squadron

**WSD**—Weather Support Document

**WSR-88D**—Weather Surveillance Radar - 1988 Doppler

**WW**—Weather Warning

**XOW**—Directorate of Weather

### *Terms*

**Combat Weather Team (CWT)**—A weather unit that provides terrestrial or space weather support to an Air Force, Army or other supported unit. The unit may be located with the supported unit on an Air Force base, Army post, remotely located in a another weather unit, or at a deployed location.

**Meteorological Watch (METWATCH)**—The process of monitoring the weather or the space environment in an area or region. The purpose of a METWATCH is to identify when and where observed conditions are different from forecast conditions so the forecast product can be amended and designated agencies notified. AFWA and OWSs typically METWATCH their products.

**Mission Execution Forecast (MEF)**—A forecast product that provides the weather and space environmental conditions for a specific mission. The CWT develops the MEF from MOAFS, TAFs and other forecast products.

**Military Operating Area Forecast (MOAF)**—A forecast guidance product that provides the weather or space environmental conditions for a specific area in which military operations are occurring.

**MISSIONWATCH**—The process of monitoring the weather or space environment for a specific mission. The purpose of a MISSIONWATCH is to identify and alert the supported unit to changes in the Mission Execution Forecast (MEF) or provide a new MEF because of changes to the mission itself. The CWT typically performs a MISSIONWATCH.

**Weather Advisory (WA)**—A special notice provided to supported agencies that alerts them to imminent or actual occurrence of weather conditions that could affect their operations.

**Weather Warning (WW)**—A special notice provided to supported agencies that alerts them to the imminent or actual occurrence of weather conditions of such intensity as to pose a hazard to life or property for which the agency must take immediate protective actions.

**Weather Watch**—A special notice provided to supported agencies that alerts them of a potential for weather conditions of such intensity as to pose a hazard to life or property for which the agency should consider taking protective action if required.